

DRAWINGS

Please replace drawing sheet 3/5 with the enclosed Replacement Sheet. In addition to the clean version, a marked-up version of the replacement sheet is also enclosed showing changes in red pen.

REMARKS

At the time that the Office Action issued, claims 1 to 33 were pending. The present amendment amends Figure 3, amends claims 1, 14, 20, 27-29, cancels claims 16 and 31 to 33, and adds new claims 34-63.

This brings the total of claims in excess of twenty to 38, and the number of independent claims in excess of three to 6. The highest number of claims in excess of twenty already paid for is 13, and the highest number of independent claims in excess of three already paid for is 5. Hence, the present amendment incurs an additional claims fee for 25 claims and one independent claim, and the Commissioner is hereby authorized to charge the corresponding amount to Deposit Account No. 19-1800.

Drawings

A replacement sheet containing amended Fig. 3 is herewith submitted to comply with the requirement as set out in Numbered paragraph 1 of the Office Action. The amendment adds reference number 300 to indicate the chamber, which follows from the remaining features as described in section [0025] of the specification. Hence, it is respectfully submitted that the amendment does not constitute addition of new matter.

Explanation of Claim amendments

The phrase "wherein said apparatus is incorporated in a downhole sampling device" has been added to Claim 1. This is based on page 6 lines 2-3 of the specification.

Claims 1, 14, and 20 have been broadened in a sense by deleting the word "moveably" from these claims. The removal is supported by the specification on page 16 lines 6-8, and in paragraph [0014], where both a moveably positioned reflector and a substantially stationary reflector are mentioned. The broadening does not impose an additional burden on the Examiner, as at least original claim 31 did not contain the limitation "moveably positioned".

In addition, Claim 14 has been amended to recite subject matter from original claim 16.

Claim 20 has been amended to include the phrase "all incorporated in a downhole sampling device" for which basis is found on page 6 lines 2-3 of the specification. Moreover, an additional step of "drawing a formation fluid from an earth formation" has been included, as based on paragraphs [0023] to [0025], and also on paragraph [0051]. Claim 20 has further been amended to recite that the transmitting of the acoustic signal and the detecting of reflections are performed under in-situ conditions, as based on paragraphs [0003], [0024], and [0055].

In claims 27 and 28, the term “a predetermined temperature” has been changed to “the predetermined temperature”, as an antecedent basis has been provided in claim 26. Claim 29 has been amended to change the claim dependency.

New claim 34 specifically recites embodiments wherein the reflector is substantially stationary as based on page 16 line 8, and on the second line of paragraph [0014] and on original claim 31, where a substantially stationary reflector is mentioned.

New claims 35, 36, 38-39, 41-42, 50, 53, and 62 specifically recite embodiments wherein the reflector is moveably positioned. These claims are based on original claims 1, 14, and 20 from which claims the word “moveably” has been deleted.

New claim 37 is based on page 6 lines 2-3 of the specification.

New claim 40 is based on lines 5-6 of paragraph [0028], the first seven lines of [0039] and Fig. 3 showing distance D and different lengths of paths 332 and 334 associated with the first and second reflective surfaces.

New claims 43 to 47 are respectively based on original claims 5, and 7 to 10.

New claim 48 is based on lines 5-6 of paragraph [0028], the first seven lines of [0039] and Fig. 3 showing distance D and different lengths of paths 332 and 334 associated with the first and second reflective surfaces.

New claim 49 is based on original claim 13 written in independent form. It includes the features recited in original claims 1, 12 and 13, combined. However, the word “moveably” that appeared in original Claim 1 has been left out (see above), and the features of original claim 11 have been drafted in dependent form in 51.

New claim 52 is based on original claim 1 combined with subject matter based on lines 5-6 of paragraph [0028], the first seven lines of [0039] and Fig. 3 showing distance D and different lengths of paths 332 and 334 associated with the first and second reflective surfaces.

New claims 53 and 54 take subject matter from original claims 1 and 5, whereby it is remarked that “piezoelectric” has been removed from the claim. Basis is found in original claim 14, where the term “transducer” appears without it being limited to “piezoelectric transducer”.

New claim 55 is based on original claim 26 drafted in independent form by combining the subject matter of original claims 20 (“moveably” left out), 25, and 26. New claims 56 to 59 are based on original claims 27 to 30. New claim 60 is based on original claims 31 and 33 (both reciting “transducer”), and new claim 62 is based on lines 5 and 6 of paragraph [0027].

New claim 63 is based on original claim 11.

It follows from the above explanation that every claim amendment finds basis in the original claims and specification. Hence, it is respectfully submitted that the amendments do not constitute an addition of matter.

Allowable subject matter

In Numbered paragraph 8 of the Office Action under header "Allowable Subject Matter", the Examiner has kindly identified claims 6 to 10, 13, 16, 19, and 26-30 to contain allowable subject matter. Examiner is cordially thanked for this acknowledgement.

As explained above, the word "moveably" has been deleted from the independent claims. It is respectfully submitted that the deletion of the word "moveably" does not impact the allowability, because the Examiner has acknowledged allowability even having considered a moveably positioned reflector to be known from Coupland et al (US Patent 6,912,891) (see Numbered paragraphs 3, 6, 7, and 8). Thus, the holding of allowability did not rely on this feature, and for this reason the removal of the word should not affect the Examiner's opinion on allowability.

Other than this deleted feature, it is herewith submitted that currently amended Claim 14 is largely based on original Claim 16 drafted in independent form. However, attention is drawn to the words "near the first end" which have not been incorporated in Claim 14. Attorney for Applicant submits that these words do not constitute a meaningful limitation that would be required for patentability. Hence, it is expected that currently amended Claim 14 is still in an allowable state.

New Claim 49 is intended to present subject matter from original Claim 13 in independent form. However – in addition to the deletion of "moveably" – the features of original claim 11 (which formed an intermediate claim to original claim 13) have not been included. Attorney for Applicant submits that these features are not necessary for patentability. Neither are these features required to provide antecedent basis for remaining features of original claims 12 and 13. Therefore, it is expected that even without the features of Claim 11 new Claim 49 is still in an allowable state much as original Claim 13 was.

Other than the deleted feature "moveably", new Claim 55 consists of original claim 26 redrafted in independent form by combining claims 20, 25, and 26. Hence, new Claim 55 is in an allowable state.

In conclusion, based on the statement made in Numbered paragraph 8 in the Office Action and the arguments above, it is thus submitted that independent claims 14, 49, and 55 are in allowable state as well as claims 15 to 19, 41 to 48, and 56 to 63, all of which ultimately depend on one of base claims 14, 49, and 55.

Claim rejections under 35 USC § 102

Claims 1, 14, 20, 31 and 33 have, in Numbered paragraphs 2 and 3 of the Office Action, been rejected under 35 USC § 102(e) as being anticipated by Coupland *et al* (US Patent 6,912,891).

The rejection of Claim 14 has been overcome because it has been amended to include allowable subject matter from Claim 16 (see hereinabove).

The rejection has been mooted in respect of Claims 31 to 33, as these claims have been canceled.

Insofar as applicable to the currently amended other claims, the rejection is respectfully traversed.

Coupland *et al* disclose a method of using ultrasonic reflectance to characterized physical properties fluids. Specific fluids mentioned relate to food solutions such as milk, ketchup, syrup, chocolate, and other confectionary. The method includes generating ultrasonic longitudinal waves (Col. 5, line 10), and sending them into a delay line (Col. 5 lines 31-48). The delay line is formed of a solid object in contact with the fluid where an interface is formed between the solid and the fluid. The waves travel through the solid to the interface where they are partially reflected back through the solid before being detected. The delay line can be the wall of any food processing equipment or packaging (Col. 5 line 41-42). Hence, Coupland *et al* teach detecting waves that have only traveled through the delay line. This is confirmed in Col. 7 lines 17-19 where it is stated that the invention (of Coupland *et al*) is concerned solely with the use of ultrasonic reflectance from (and not transmittance through) the sample being investigated.

With regard to currently amended Claim 1, it is respectfully observed that Coupland *et al* at least do not disclose or teach incorporation in a downhole sampling device. Thus, Coupland *et al* do not anticipate currently amended Claim 1.

Likewise, currently Claim 20 is not anticipated by Coupland *et al*.

In addition to rejecting claims 1, 14, 20, 31 and 33, observations have made in numbered paragraph 3 regarding features of dependent claims. Applicant does not agree with these observations but, as none of the dependent claims in are anticipated by Coupland *et al* by virtue of their dependence on not-anticipated base claims, it would be redundant to comment on the observations one by one.

Claim rejections under 35 USC § 103

Claims 2 to 4 and 15

In Numbered paragraphs 4 to 6, claims 2 to 4 and 15 have been rejected under 35 USC § 103(a) as being unpatentable over Coupland *et al* in view of Brown *et al* (US Patent 6,467,544).

The rejection states that Coupland *et al* show in Fig. 8 a chamber which comprises a sealed first end, a motor. However, it does not disclose a piston slidably disposed within a second end of the chamber and a conduit for introducing the fluid into the chamber. It is further stated that Brown *et al* disclose the sample module includes a chamber for receiving

and storing fluid, and a piston slidably disposed in the chamber (see Col. 3, lines 21-23). The Office Action claims that it would have been obvious to one having ordinary skill in the art at the time of the invention to utilize in Coupland *et al* the slidable piston of Brown because it would define a sample cavity and a buffer/pressurization cavity, the cavities having variable volumes determined by movement of the piston thereby obtaining effectively the pressurization cavity to control the pressure of the collected sample fluid in an efficient manner.

Attorney for applicant respectfully traverses this rejection.

Coupland *et al* are concerned with an ultrasonic reflection technique to characterize food solutions.

Brown *et al* are concerned with improvements specifically relevant for collecting subsurface formation fluid samples, such as "low shock sampling" (Col. 9 lines 42-45), and avoiding "dead volume" which is specifically a problem related with sampling at downhole conditions.

Brown *et al* offers certain advantages, as pointed out in the Office Action, but these are not relevant for the technology of Coupland *et al*. For instance, while being useful for downhole sampling, it would not have been obvious to adopt the piston arrangement as disclosed by Brown *et al* into the teaching of Coupland *et al*, because it would add complexity for which there is no need because Coupland *et al* teach to simply measure the food solutions in their processing equipment or packaging. In fact, Coupland *et al* even state that "there is little or no need for modification of existing equipment in order to use the invention in a working plant under real conditions". Coupland *et al* thus teach away from adding complicated sampling equipment of Brown *et al*.

Thus, it is respectfully submitted that it would not have been obvious to combine Coupland *et al*'s disclosure with that of Brown *et al*.

This also follows from MPEP 2143.01, which discusses that the desirability of the claimed invention must be suggested in the prior art. However, in the present case there is no teaching in Coupland *et al* to combine the acoustic with a downhole sampling device, nor in Brown *et al* to incorporate in their device an apparatus for acoustically analyzing a fluid. Even if all aspects of the claimed invention were known in the art, this fact alone is not sufficient to establish a *prima facie* case of obviousness without an objective reason to combine the teachings of the references. In the present case, as seen from the skilled artisan who has to rely on the art as published, such objective reason is not provided in the art but only in the patent application that is under examination.

The arguments provided above are not only also relevant to the claims 2-4 and 15 (to which the Examiner originally applied Coupland *et al* in view of Brown *et al*), but also to

amended claims 1 and 20. In conclusion, it is therefore submitted that these claims are not obvious over Coupland *et al* in view of Brown *et al*, either.

Claims 11-12 and 17-18

In Numbered paragraph 7 of the Office Action, claims 11-12 and 17-18 have been rejected under 35 USC § 103(a) as being unpatentable over Coupland *et al* in view of Chung *et al* (US Patent Re 33,837).

Regarding claims 11 and 17, the Office Action specifically states that Coupland does not disclose first and second electromagnetic coils being independently driven for manipulating the reflector. It is then stated that Chung discloses that rods 66 and 70 may, for example, be prestrained by corresponding permanent magnets 120 and 122 carried above them in reflector 76. Alternatively electromagnetic coils may be substituted for magnets 120 and 122 in some applications in which permanent magnets might be prohibitively bulky.

The argument continues by stating that it would have been obvious to one of the ordinary skill in the art at the time of the invention to utilize in Coupland the electromagnetic coils of Chung because whereas magnetostrictive material having a positive strain constant will elongate (and magnetostrictive material having a negative strain constant will contract) with magnetization independent of the sign (positive or negative) of the magnetic field applied, the amount of such movement is related to the absolute magnitude of the applied magnetic field thereby making the above combination able to drive or manipulate the reflector effectively.

Attorney for applicant respectfully traverses the rejections.

A careful review of Chung *et al*, revealed that the magnets 120 and 122 serve to prestrain the rods 66, 70, and not the reflector 76 (see, for instance, Col. 11 lines 63-65). Hence, these magnets are not for manipulating the reflector.

Moreover, when applied to Claim 11 as dependent on currently amended Claim 1, Claim 11 contains every feature of Claim 1 including "said apparatus being incorporated in a downhole sampling device". Neither Coupland *et al*, nor Chung *et al*, disclose such downhole sampling device. Rather, Chung *et al* disclose a logging sonde that generates an acoustic wave and transmits it into the earth. Hence the combination of Coupland *et al* and Chung *et al* also for that reason fails to disclose each and every feature of Claim 11.

When applied to Claim 17 as dependent on currently amended Claim 14, neither Coupland *et al*, nor Chung *et al*, disclose a static piston mounted within a fluid chamber for supporting the transducer within the fluid. Hence the combination of Coupland *et al* and Chung *et al* also fails to disclose each and every feature of Claim 17.

Since the cited references do not teach all the claim elements, it follows from MPEP 2143 that no *prima facie* case of obviousness has been established.

Consequently, withdrawal of these rejections based on Coupland *et al* in view of Chung *et al* is kindly requested.

Regarding claims 12 and 18, there is one more reason why the Examiner has not established a *prima facie* case of obviousness.

The Examiner has focused on an argument regarding “analyzing a property of the fluid comprising at least one of velocity, volume, density, compressibility and viscosity”, but not identified any finding place in the cited references for the feature “the reflector comprises at least one of a first reflective surface and a second reflective surface”.

In this respect, attention is drawn to new claims 40, 48, and 52, which also comprise features “first reflective surface” and “second reflective surface”.

Of these, claims 40 and 48 depend on a base claims for which arguments in support of patentability have been provided hereinabove. However, new claim 52 is an independent claim. It is respectfully submitted that amongst the reasons that this independent claim patentably distinguishes over the cited references is that none of these references disclose first and second reflective surfaces in the way as claimed.

Claim 24

In Numbered paragraph 8 under header “Claim Rejections – 35 USC § 103”, Claim 24 has been rejected under 35 USC § 103(a) as being unpatentable over Coupland *et al* in view of Lynnworth (US Patent 5,515,733).

Attorney for Applicant respectfully traverses the rejection.

Insofar as applied to Claim 24 depending on currently amended Claim 20, various elements of Claim 24 are not present in the cited combination of references such as “a downhole sampling device”, “drawing a formation fluid from an earth formation”, etc.

Therefore, no *prima facie* case of obviousness has been established against the claims presently on file.

Consequently, the Examiner is kindly requested to withdraw the rejection based on Coupland *et al* in view of Lynnworth.

Concluding remarks

Attorney has addressed each and every ground for objection and rejection raised by the Examiner in the Office Action. In particular, it has been explained why independent claims 14, 49, and 55 comply with the requirements as set out in the Office Action under “Allowable Subject Matter”, and why the rejections set out in the Office Action are not applicable to the remaining independent claims 1, 20, and 52.

Attorney respectfully submits that the claims, both new and as amended, are now in a state ready for allowance. In the event the Examiner has any questions or issues regarding the present application, the Examiner is invited to call the undersigned prior to the issuance of any written action.

Respectfully submitted,

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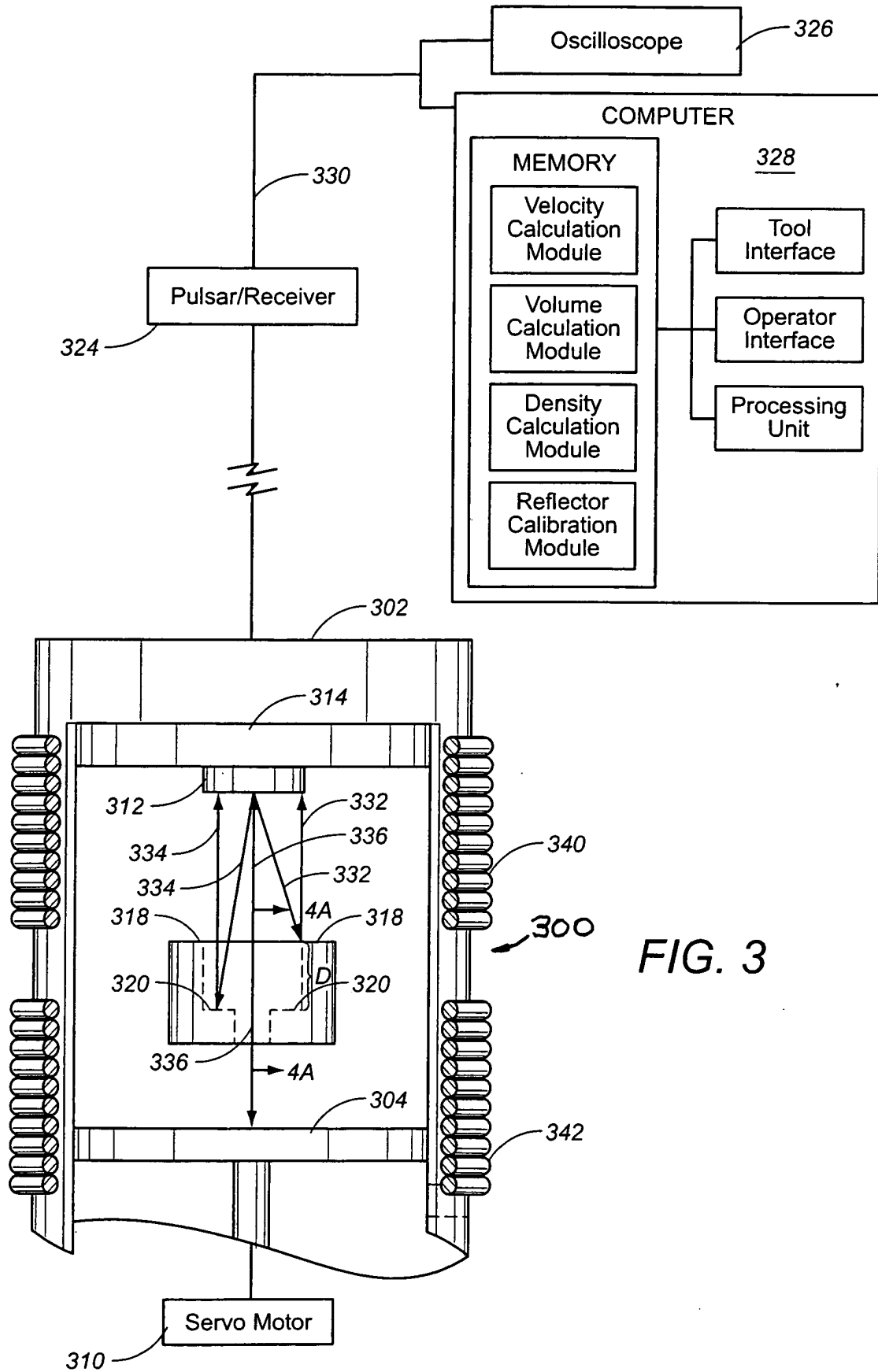


FIG. 3